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ABSTRACT

One hundred seventy-one middle school students participated in a study to assess cognitive activity during television viewing. Students completed a questionnaire about their favorite programs, viewing habits, and social reality beliefs, then viewed a 17-minute professionally edited episode of a family drama and answered a multiple choice questionnaire. The subjects also kept diaries of their home television viewing for three days, from which the amount of viewing was determined for six categories: comedy, crime-adventure, drama, cartoons, public affairs, and variety. The three main learning measures were central content learning, incidental learning, and inference-making abilities. Distinguishing between attentiveness and amount of viewing, the results indicated that viewing and preference were predictably related. However, viewing was much more weakly related to attentiveness. In general, older children, girls, and those who scored higher on school achievement tests learned more from viewing the family drama episode, confirming that learning more reflected more advanced information processing skills. In contrast, attentiveness to television was unrelated to sex or academic achievement and related to grade only in ways that reflected changing program preferences with age. Surprisingly, correlations between attentiveness and learning indicated that more attentive viewing over a long term was associated with reduced learning from a specific television program. (HTH)

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Survey Measurement of Cognitive Activity During Television Viewing

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At its most basic, research on cognitive activity during television viewing boils down to very simple questions, such as "What do people do while they watch television?" or "What goes on inside their heads?" Unfortunately, answering those simple questions has proved to be rather difficult. For a long time, they were generally regarded as unanswerable, fit for speculation about "mediating processes," but little else. In recent years, however, researchers have taken these questions more and more seriously, and attempted various means to measure both the amount and nature of cognitive activity during viewing.

A good deal of relevant research has used the term attention, especially research aimed at locating differences in the strength of media effects for different values of attention, thus suggesting that attention identifies important cognitive processes intervening between message reception and effect. For example, Chaffee and Choe (1979), in pilot testing a variety of television news and newspaper measures for inclusion in a large survey, compared the predictive power of exposure measures and attention measures (i.e., "how much attention" questions that could be answered "a great deal," "some attention," or "don't pay much attention."). Across a variety of problem, candidate, and issue awareness measures, the amount of exposure to television news accounted for an average of less than 1% of the variance, while attention to television news accounted for an additional 6%. Simple exposure to newspapers does better, averaging about 5% of the variance, but even here the attention measure adds 3-4% more. In other words, the amount one uses news may be less important in determining what one retains than how one uses, and here high attention consistently predicted greater learning.

Likewise, McLeod, Luetscher and McDonald (1980), found that attention added significantly to the variance accounted for in one of three political dependent

variables, even after demographics, overall exposure, content-specific exposure, and reliance on newspapers and television had been entered in the regression equations. More to the point of arguments for attention measures reflecting intervening processes, the attention-exposure interactions were related to the dependent variables four of six times for newspapers and five of six times for television.

The problem with such self-reports of attention, of course, is in knowing just what "attention" means. A plausible argument can be made that they simply register the amount of cognitive activity habitually engaged in during a certain kind of mass media use, but they could also have something to say about the nature of that activity as well, perhaps reflecting more critical analysis of information, more integration of information with existing world-knowledge, or more activation of partisan predispositions or attitudes, etc. In addition, people are probably more able to reliably report their attention (whatever that means) for very specific content domains such as TV news or magazine ads than for television or newspapers in general, making it difficult to transfer findings from political communication to effects of entertainment media.

In research on children and television, the term "attention" has often been operationalized simply as visual orientation to the television screen. As such, it was used to reflect a conceptualization having little to do with cognitive activity. Where it was included in social learning theories of television effects, attention to television was merely a necessary but not sufficient condition to learning from the stimulus -- a gateway that must be opened in order for cognitive processing of messages to begin (Liebert, Neale and Davidson, 1973). And, in fact, much of the research on attention to television was directed to locating those attributes of the television stimulus -- cuts, music, funny voices -- that elicited the child's orienting response, so that comprehension could be enhanced by manipulating those attributes to maximize visual orientation

or focus it toward key concepts (Anderson & Levin, 1976; Lesser, 1974; Rice, Huston & Wright, 1982).

While the logical necessity of being open to a message as a precondition for comprehension (or any other cognitive activity) is clear, two recent studies by Dan Anderson and his colleagues demonstrate that visual orientation to television indicates something more, at least for young children. Their findings indicate that even very young children actively direct their attention to content that is comprehensible to them (and away from that which is incomprehensible). Thus, Lorch, Anderson and Levin (1979) manipulated five-year-olds' attention to Sesame Street with the presence or absence of toys in the viewing room. Naturally, the two groups differed greatly in the amount of time they watched the television (87% vs. 44%), but there was no difference in their comprehension of the program. Yet within the "toys" group, visual attention and comprehension were correlated (insufficient variance in attention for the "no toys" group), suggesting that the correlation of attention and comprehension results from comprehensibility directing attention.

That hypothesis was then tested more directly by Anderson, Lorch, Field, and Sanders (1981) by experimentally reducing the comprehensibility of Sesame Street segments. Children's attention to distorted segments was significantly reduced even for two-year-olds, whose overall attention was much lower than that of 3-1/2 or five-year-olds. Given this combination of results, we find it fairly easy to concur with Anderson, et al. (1981) that "a major determinant of young children's visual attention to a television program is the degree to which they are able to comprehend it" (p. 156).

From these and other results (see especially the review by Anderson and Lorch, 1983), they argue that the strong relationships found between visual attention and various content attributes result in part from children learning

that these attributes tend to signal significant content, and that comprehensibility is a prime factor in determining significance for young children. Thus, it seems that even very young children develop viewing strategies keyed on content attributes that allow them to monitor television while dividing their visual orientation between television and other activities. More importantly for our purposes, variations in young children's visual orientations to television may well serve as an indicator of the amount of prior cognitive activity directing that orientation, although inferences about the nature of that cognitive activity will have to come from other sources, such as analyses of attribute patterns, relations of audio and visual attention, and attempts to separate the orienting response and actively directed components of visual attention.

Another major attempt to get at cognitive activity directly has been through the use of electroencephlographic (EEG) recordings made during television viewing, based on research pointing to the alpha portion of EEG as an inverse indicator of cognitive activity (Greenfield & Sternbach, 1972). The advantage of EEG, of course, lies in its potential both for more time-specific measurement linking activity and attention to discrete television elements, and in the face validity of measuring something inside the head instead of merely an exterior orientation. In comparison to observations of visual orientation, EEG can potentially show great variability measured continuously while simultaneous dichotomous measures of visual orientation show no variation at all.

Despite these potential advantages, it should be said that EEG at present suffers the same validity problems as simple visual orientation. Some aspects of EEG, particularly alpha, seem to have a great deal to do with simple orienting responses as well. And while EEG measurements probably do have something to do with the amount of cognitive activity, research directed at linking EEG and the nature of that cognitive activity is just beginning.

Both observing individuals' visual orientations and obtaining EEG measures require substantial investments of time and effort, which tends to focus the research effort on this one "best" measurement. We grant that such research is very useful in illuminating cognitive processing, but it needs to be complimented by research aimed at understanding the variety of cognitive activities and how they interact. Such multivariate questions are typically asked by survey research, but as we have seen, simply asking people "how much attention" they have paid, while useful as an intervening variable in political communication, casts little light on the nature of that attention.

However, there is more that survey research can do. Salomon recently has been asking children to assess the amount of effort they invest in processing television (or other) materials, and has had some success using this variable both as dependent and as intervening in effects (1983). Several recent exploratory studies (e.g., Rouner, 1983) have used survey techniques to try to distinguish cognitive activities of differing types and at differing times in the sequence of media use behaviors.

Our goals here are essentially methodological and exploratory. We obtained a number of survey measures we believed would indicate cognitive acitivity, some by asking children directly and others constructed from children's reports of various television-related behavior. For each measure, we had expectations about the sort of cognitive activity it should tap, and we directed analyses to test these expectations based on the ways the measures interrelated and on how they related to children's comprehension of a specific television program. In all this, taking a survey approach to measuring cognitive activity means that we must assume there is some habitualness to such activity and related behaviors -- that it is not entirely situational.

Thus, if visual orientation to television can be regarded as at least somewhat stable over time for individuals, we should be able to make some predictions about who will learn more or less from viewing television. To the extent that

visual orientation is simply a necessary condition for comprehension, it should be positively related to learning explicit, plot-relevant (central) content, since those who look away or divide their attention between television and other activities run the risk of missing some key event. Redundancy and predictability in television content, and planning, strategies and schemas on the part of viewers should lead to a ceiling effect in central learning and wipe out any relationship to visual orientation. However, there should be no such ceiling effect for learning of explicit but plot-irrelevant (incidental) content. Since such content by definition is of no use in understanding the plot, it is probably learning largely by accident, and thus such learning should be strongly dependent on visual orientation as a necessary condition. For a third type of comprehension, that of plot-relevant but implicit information (which the viewer must infer), visual orientation as a necessary condition should not be predictive, since the essential process behind variance in learning inferred content is the internal use of information and not its simple acquisition.

We would like to also make predictions about visual orientation as reflecting cognitive activity, but cannot in survey research. From Anderson's work, visual orientation to television reflects a child's judgment that content is presently comprehensible, and thus presumably also cognitive activity that led to that judgment as well. Variation in visual orientation is thus clearly meaningful <u>within</u> respondents for small units of time, but less clearly so <u>between</u> respondents. Aggregated over time, young children who watch a relatively high percentage of a program might be judged to have found it more comprehensible than those who watched a smaller percentage of the time, but even here we would be uncomfortable claiming that the first group had been more active overall during the program. With older children, claims from average visual orientation to average cognitive activity would be even more questionable, since it is easily argued that comprehensibility becomes drastically less

important as a "driver" of visual orientation even during elementary school (Pingree & Hawkins, 1982).

However, it should be possible to use television diaries of viewing to distinguish children who are more or less likely to change channels during programs, and such channel switching might well reflect a more active approach to viewing. Similarly, watching programs because one particularly seeks that program out might be associated with more cognitive activity during viewing than simply watching because the set was already on or because other family members were watching the program. Thus, we developed measures based on these ideas, and compared them to both our survey measure of visual orientation and the learning measures.

METHODS

Respondents

Participants in this study were 171 fifth, sixth, and seventh graders from the middle school of a town of 3000 about 30 miles from Madison. The town is a marketing center for surrounding farms, but the area is also served by two larger towns and by Madison. Employment of the children's parents is concentrated in agriculture and in a variety of small manufacturing firms in nearby towns and cities, so that the socioeconomic background of a majority of the children could be characterized as blue collar.

The ages included in the study provide a deliberately restricted range. We chose fifth, sixth, and seventh graders to capture the transitional ages when the television-comprehension abilities we wanted to study appear and are brought under control for most children (Collins, 1982). This allows us considerable individual differences in inference-making ability, for example, while reducing the importance of extraneous age-related changes.

Procedure

The survey was divided into two basic sessions, the first of which was administered to all participating children from each grade simultaneously in the school lunchroom. Questions and response choices were read out loud by one of the authors while an assistant circulated to answer questions and monitor progress. The questionnaire at this first session asked about children's favorite programs, television viewing habits and social reality beliefs (a mixed list of about 30 Likert-scale items), and a diary check-list of their viewing the previous day. Two and three days later, additional diaries were completed during homerooms under the supervision of the children's teachers.

Two weeks later the children were brought in groups of 10-15 to a small rehearsal room also used by the school for viewing televised instruction. As the children sat on two old couches or on the floor, the same author who read the first questionnaire explained that we had edited an hour-long television program into a shorter version to use in another study. In order to thank them for helping us with our survey, we wanted to show them our tape and incidentally find out from them whether they thought other children would like it.

The children then viewed a 17-minute, professionally-edited version of an episode of "The Fitzpatricks," a family drama about a working-class family that was telecast for only a few weeks during the fall of 1977. The plot centered around a 10-year-old boy who blamed his best friend for not preventing the theft of his bicycle. While the two boys are estranged, the protagonist has trouble with his paper route, is regularly late for school, and is constantly in strife with other family members. Meanwhile, one older brother and the best friend spend all their time looking for the stolen bike while another older brother builds an odd-looking substitute out of a motley collection of junk.

The two boys are finally reconciled (to their mutual relief) and the story closes on a joyful note as they play space wars together on the new bike.

Judging by the children's attention to the television and their reactions during the program, they found it interesting and rather involving. Immediately after the program was over, they were asked to fill out a set of multiple-choice questions about the program.

Measures

From the television viewing diary, we derived the amount of viewing across three days of each of six, mutually exclusive viewing categories: comedy, crime-adventure, drama (a story emphasizing neither comedy or action), cartoons, public affairs (including news), and variety (including music, talk and That's Incredible).

The three main learning measures were modeled on those used by Collins and his associates in a number of their recent studies (Collins, 1982). Learning central content (plot-relevant, explicit) from the Fitzpatricks was assessed with eight questions about key plot events, each accompanied by five multiple-choice responses (e.g., What did R.J. do to help Max?). The central learning score for each student was the number of questions answered correctly. Incidental learning (explicit but plot-irrelevant facts) was assessed with eight additional questions about minor facts (e.g., What was the name of the newspaper that Max delivers for?). Inference-making abilities were assessed with three questions that required the child to put together two pieces of information temporally separate in the program to draw a conclusion crucial to the plot but never explicitly presented. For example, in one scene Max's mother says she is going to find R.J., and in a later scene R.J. finds Max at the dump. The implication is that R.J. knew he should go find Max because Max's mother told him to, but this is not obvious to all respondents.

While we expected increases in central and inferential learning even during this limited age range (past research suggested that this should be the age for peak incidental learning, with lower scores for younger and older children; see Collins, 1982, for more detail), we were concerned that inference scores especially might partially represent general academic abilities. To allow for checks of this possibility, we obtained from the schools standardized math and reading test scores for each student, and coded them as percentiles for grade level.

The degree to which a child actively monitored television viewing was assessed from the television diary by noting all those points at which the child indicated watching more than one program during a time period or indicated turning the program off before it was over. The variable we labeled Channel Switching was thus a proportion of the total number of programs viewed for which this was the case.

Each day, after children indicated which programs they had watched the night before, they were asked to go back through their diary and place different marks by programs to indicate those that they watched 1) because they especially wanted to see that program, 2) because they usually watch TV at that time, 3) because the set was already on, or 4) because another family member was watching. We then formed four variables that were simply the number of programs marked in each category, although we expected only the first to indicate more active viewing. A final measure of habitual thinking while viewing was a direct agree-disagree response to the statement, "When I watch a TV show, I think about it while I am watching."

Our survey measure of visual orientation to television was derived from two questions, each of which allowed students to list up to six names of television programs. Students listed shows they "watch without doing anything else" (Attentive Viewing) and shows they "watch while doing other things" (Divided Attention).

A third question, shows they "just never miss if they can help it" (Favorites) was included to help in validating the visual orientation measure derived from these two. The 93 different programs listed on these three questions (treating sport and news nominations each as a single generic category), were then assigned to eleven content categories, but 65% - 80% of the nominations in each case were of comedy or crime programs.

Within these two content categories, the numbers of programs listed as watched attentively is only weakly related to the number listed as watched with divided attention: correlations of .13 for comedy and -.11 for crime. Since the two were relatively independent, we then formed measures of relative attentiveness of comedies and crime by subtracting the number of programs nominated under divided attention from the number watched attentively. Someone who lists three comedy programs they watch without doing anything else and no comedy programs as watched while doing other things can reasonably be labeled as attentive to comedy -- certainly more so than someone whose comedy listings are the reverse. Note that this procedure produces variables that are at least somewhat independent of the sheer number of programs listed, something on which students varied considerably. We also formed an overall measure of relative attentiveness by simply subtracting the total number of programs listed as watched with divided attention from those listed under attentive viewing. While the meaning of this latter measure is less clear-cut than the other two because of the mix of content types in the nominations, it is potentially useful as a survey surrogate for one's overall visual attentiveness during television viewing.

RESULTS

Relative attentiveness to a given type of content or to television in general is conceptually distinct from the amount of viewing. That is, while one could theorize about reasons for attention and viewing to be linked (e.g., greater

viewing leads to boredom and lower attention) there is no necessary, logical connection between the two. Heavy viewers could be either more or less attentive, and in fact hypotheses could be argued for either a positive or negative relationship. For our purposes of validating a survey method of measuring attention (by subtracting the number of programs watched with divided attention from those watched attentively), we would be most comfortable if attention could be shown to be separate from viewing.

Thus, Table 1 presents the relationships between viewing -- comedy, crime and total viewing from the TV Diary -- and relative attentiveness to comedy, crime, and television in general. By way of comparison, the top half of Table 1 demonstrates that viewing and nominations of programs as favorites (presumably a measure of preference) are related. The correlations between viewing and favorites are generally strongest along the diagonal of the matrix where the comparison is most direct (i.e., between viewing comedy and attentiveness to comedy). In addition, the cross-type relationships are also significant, except that viewing crime programs is unrelated to nominations of comedy as favorites or to the total number of nominations.

That viewing is related to our measure of preferences (favorites) comes as no surprise, but it does provide a context for examination of the bottom half of Table 1, where viewing is compared to the attentiveness measures derived from questions closely related to the measures of favorites. Here, in contrast, the viewing measures are much more weakly related to the attentiveness measures. More to the point, all three relationships on the diagonal of the matrix are non-significant; viewing a particular type of content is <u>unrelated</u> to attentiveness to that type of content. Thus, these survey measures of attentiveness are both conceptually and empirically distinct from viewing and preferences, a finding that gives greater credibility to their face validity argument that they do in fact tap visual attention.

Because our measures of learning from television are so central to this study, and these learning measures might be highly related to school achievement or grade level, Table 2 presents correlations that are outside our hypotheses, but which represent relationships that may need controlling. In general, older children, girls, and those who scored higher on school achievement tests learned more from watching The Fitzpatricks, thus confirming that learning more reflects more advanced information processing skills (and that these four variables should be controlled for other correlations with learning). In contrast, the three measures of relative attentiveness to television were unrelated to sex or academic achievement, and related to grade in ways that probably reflect changing program preferences with age.

The positive correlations between thinking during viewing and school achievement serve to validate this measure, but the negative correlations for channel switching were unexpected (it is also not significantly related to thinking while viewing: $r = .08$, n.s.), making its interpretation as another measure of activity questionable. And marking programs on the diary as watched for various reasons was unrelated to school achievement, although girls marked more programs as watched because they especially wanted to or because they usually watch at that time.

Table 3 presents the central test of our survey measures of the ways in which children watch television -- their correlation with central, incidental, and inferential learning from a television program. Those indexing visual attentiveness to television should be strongly positively related to incidental learning, weakly to central, and not at all to inferences. Thinking during viewing and channel switching were predicted to be related to all three learning measures, although the results for channel switching in Table 2 make it a less plausible predictor. And those students who watch relatively more programs because they "especially wanted to" were predicted to thus watch with increased attention and cognitive

activity a greater proportion of the time, and thus learn more from viewing the particular program we showed.

Three of the nine correlations between attentiveness and learning are significant ($p < .10$), which is better than chance, but not substantial. What is surprising is that all three correlations (and five of the six others) are negative, so that more attentive viewing over the long term is associated with reduced learning from a specific television program. Or, in terms of the two measures that made up our measure of attentive viewing, watching television more often while doing other things than with undivided attention is related to greater learning from The Fitzpatricks. Furthermore, the results for central and incidental learning are the reverse of our hypotheses in relative strength, with significant relationships for two of the three comparisons for central learning and none of the three for incidental.

Results for the other two direct measures we thought would reflect an active approach to viewing are also mixed. Relatively large amounts of channel switching, although negatively related to school achievement, was completely unrelated to learning. Self-reported thinking while viewing television, on the other hand, was related to both central and incidental learning, although not to inference. Significant relationships between numbers of times reporting the various reasons for viewing in the viewing diary and the three learning measures are even less frequent (three of 12 $p<.10$) and are scattered instead of being concentrated on these who view more programs that they especially wanted to watch.

To further explore the meaning of these measures, Table 4 presents the correlations of the frequency of citing various reasons for viewing with the attentiveness and activity variables. There is some validation of the "wanted to see" reason for viewing here, in that it is related to the activity/attentiveness variables while the other reasons for viewing are not. In particular, marking more programs on the television diary as watched because they especially wanted

to see that program is positively associated with all three measures of relatively attentive viewing and with self-reported thinking while viewing, even though the latter two are differently related to learning from The Fitzpatricks. However, thinking while viewing is also positively related to marking more programs as watched because they are on at a regular viewing hour or because the television set was already on. Thus, we suspect that these three relationships simply reflect that those who report thinking while viewing are also much more aware of the reasons they watch specific programs. Other significant relationships in Table 4 are scattered and do not seem to indicate any pattern, although the single significant correlation for channel switching, that with programs watched because another family member was viewing, makes sense if competition with other family members for the television set is part of the reason for switching channels in the middle of a program.

DISCUSSION

Before discussing the particular results here, it is worth re-emphasizing that our goals here were to explore a variety of survey measurements as possible quick and inexpensive indices of such important television viewing behaviors as visual orientation, amount of cognitive activity during viewing, and an active approach to television program choice. The measures we used were quite disparate in their origins and their form. Thinking while viewing was a simple self-report on an agree-disagree scale. The various reasons for viewing came from a three-day television viewing diary and were simply the numbers of programs marked by the respondents as watched for that reason. The measure of channel switching also came from the viewing diary, but was instead taken from the authors' coding of the diary and noting times when two or more programs were marked as watched at the same time. The measure itself was then the proportion of all programs watched for which such partial viewing had occurred. Finally, our attempt at a survey measure of visual orientation to television was derived from two open-ended questions asking children to list programs that watched "while doing other things" and those they watched

"without doing anything else." As the criterion variables against which to test these putative measures of activity and attention we used grade in school, sex, school achievement scores, and three forms of learning from a specific television program.

The three measures of relative attentiveness to television were related to our criterion variables rather differently than we hypothesized. As we had hoped, attentiveness to comedy, to crime, and overall was basically independent of television viewing, preference for different types of content, grade, sex, and school achievement, but related to learning from a specific television program. However, the direction and patterns of those relationships are very different from what one would predict if we were measuring visual orientation toward television.

What then are these three indices measuring? The base measures from which we constructed them are simple enough that we believe what students tell us when they list programs they watch while doing other things and programs they watch without doing anything else. And operationally, the subtractive measure formed is also straightforward: for a given type of television content, watching with relatively more with or without doing other things. It seems that by asking children about 30- or 60-minute units, we have measured something quite different than Anderson's second-by-second laboratory measures of visual orientation.

Given the negative correlations, especially with central learning, dividing one's attention between television and other activities seems to reflect a more advanced and efficient television skill or strategy, although it is not related to academic achievement or grade level. This skill or strategy seems keyed to picking up explicitly presented plot-central content, and is probably a necessary precondition to follow television plots while doing other things.

In addition, it is worth noting that while this television-viewing strategy is independent of viewing (and perhaps thus experience) and general cognitive and academic development (grade and school achievement), it is also probably independent

of another important strategy for comprehending television. The leveling-off or decline in incidental learning from television with age is generally attributed to the development of a selective monitoring or memory strategy that allows one to focus on and retain central information while ignoring or not retaining incidental information (Collins, 1982). However, while we do have some evidence of the presence of this incidental learning strategy for this sample (a curvilinear pattern across grades 5,6, and 7, although non-significant within this restricted age range; grades 3,5,7, and 9 are more typical comparison points in establishing significant curvilinearity), our measures of attentive viewing were unrelated to incidental learning. So while we seem to have measured a specific television-viewing strategy that divides attention between television and other activities in association with more careful comprehension of central content, this strategy seems independent of another processing strategy that distinguishes central and incidental learning.

In pursing the nature of this viewing strategy, time seems to be a key variable. Do the comprehension advantages of attention dividers stem from thinking about the television program while they are not viewing? In that case the poorer performance of those who watch with undivided attention might mean that processing both auditory and visual information uses up their information processing capacity, leaving none for reflection or analysis of the plot. On the other hand, the alternate activities probably have their own cognitive demands and it may be that attention dividers do not think much about the television program while they are not actually watching, but simply perform relatively low-level monitoring largely through auditory cues. If this is the case, then their comprehension advantage may stem from being more cognitively active during visual attention. So we believe the questions for further research here center around such issues as <u>when</u> do attention dividers think more than non-dividers, what are attention dividers doing cognitively when they are not visually attentive, and what is the relationship of auditory attention to thinking about television content?

Measuring the frequency of different reasons for viewing from the television diaries was also straight-forward, but appears less useful as an indirect measure of habitual activity during viewing. Three of the four reasons (usually watch, set was on, and family) were not expected to reflect differences in activity, and the fourth (watching because one especially wanted to see that program) was not consistently related to learning, grade, or school achievement, although it was more common among girls. However, watching more programs one especially wanted to see was positively related to watching attentively (that is, with relatively more undivided attention), which we have just interpreted as the lack of a plot-following strategy. There appears to be no logical necessity in this relationship, and so it should be pursued for theoretical reasons. It may be that favorite programs are watched so regularly that they become highly predictable, and thus encourage a relatively lazy form of following plots. Or it could be that our measures of attentiveness tap both the results of a viewing strategy and the independent fact of undivided viewing of favorite programs. Research to disentangle this relationship should begin by looking at the joint occurrence of specific programs in both variables, and then try to establish time orders in some field experiments.

Channel switching, a measure derived from students television diaries quite independent of their own intentions, does not seem to be the independent indicator of active television use we had hoped it would be. Channel switching was unrelated to learning from television or reasons for watching, and negatively related to school achievement. We thus suspect that channel switching is not an indicator of active processing, but merely a style of watching that does not stem from any inability to process television content. Even so, the negative relationships to school achievement might indicate something about general cognitive style and attention span and deserve further exploration.

The simplest of our variables, self-reported thinking while viewing television, is perhaps for that very reason related to more different variables. Thinking while viewing was related to central and incidental learning from

television (although not inference), school achievement and most reasons for viewing, although not to channel switching or to the three measures of attentiveness. The lack of a relation to attentiveness further suggests that students may be unaware of their applications of this central-content processing strategy, or at least that they mean something different by thinking during viewing. Since such thinking seems to be related to advantages in both school achievement and television comprehension, it is unfortunate that we have so little an idea of what the simple statement means, and we need to explore this further.

In summary, instead of arriving at a best survey measure or combination of measures of activity during viewing, the measures we tested here appear to tap a number of largely independent behaviors and skills, some of which are important in comprehension and others that are not. Even those that are related to comprehension of television do not seem to be measures of the same thing since one set is related to central learning only and the other is related to both central and incidental learning. The direct comparison between attentiveness and thinking while viewing is non-significant for the two specific content types, but significant overall (r = .13, p<.05); however this weak correlation hardly indicates identity.

Even though many of the correlations we have examined here are fairly weak, even for survey research, the variability of patterns across groups of variables strikes us as sufficient indication of varying skills and strategies. Several of these measures may bear further use as they stand; others need considerable exploratory work and interpretation. But given the number of recent studies in which a variety of measures of activity during viewing (usually very indirectly measured) have been important either as intervening variables or as unanticipated direct predictors of "effects" variables (e.g., Hedinson & Windahl, 1983; Pingree, 1983; Potter, 1982), we think it is time to pursue these variations in skills and activities more directly and comparatively.

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Table 1

Correlations Between Attentiveness and Number of Favorites and Television Viewing

	Viewing		
Number of Favorites:	Comedy[a]	Crime[a]	Total
Comedy	.26***	-.05	.25***
Crime	.17**	.12*	.15**
Total	.28***	-.02	.32***
Attention:			
To Comedy	.06	.17**	.12*
To Crime	.13**	.00	.02
Total	.12*	.09	.07

* p<.10
** p<.05
*** p<.01

a. Correlations in the columns for viewing comedy or crime are actually partialed on all other viewing, thus giving an estimate of the independent relationship for that content type.

Table 2

Pearson Correlations of Learning, Activity and Reasons for Viewing With School Achievement, Grade and Sex

	Reading Achievement	Math Achievement	Grade	Sex[1]
Learning				
Central	.14**	.07	.18***	-.14**
Incidental	.34***	.25***	.05	.05
Inference	.27***	.24***	.19***	-.15**
Attentiveness				
To Comedy	-.07	-.08	-.12*	.04
To Crime	-.09	.01	.20***	-.05
Overall	-.06	.02	.02	-.01
Channel Switching	-.17**	-.12*	-.03	-.05
Thinking During Viewing	.11*	.24***	-.12*	-.07
Reasons For Viewing[2]				
Wanted To	.10	.10	-.04	-.19***
Usually Watch Then	-.00	.03	.06	-.24***
Set Was On	.01	-.09	-.15**	.06
Family Watching	-.05	-.05	-.01	-.03

* p<.10
** p<.05
*** p<.01

1 sex is coded 1 = female, 2 = male

2 correlations for reasons for viewing are all partialed on total viewing

Table 3

Correlations of Learning From Television

With Activity and Reasons

	Learning		
	Central	Incidental	Inference
Attentiveness			
To Comedy	-.11*	-.01	-.15**
To Crime	-.03	-.02	.08
Overall	-.11	-.05	-.01
Channel Switching	-.03	-.09	.01
Thinking During Viewing	.10*	.13**	.00
Reasons For Viewing			
Wanted to	.01	.03	.12*
Usually Watch Then	.10*	-.02	.01
Set Was On	-.01	.06	-.06
Family Watching	.12*	.07	.03

* p<.10
** p<.05
*** p<.01

All are partial correlations controlling for grade, sex and school achievement. Additionally, total viewing is controlled in the bottom four rows of the table.

Table 4

Correlations Between Activity/Attentiveness and

Numbers of Programs Watched for Various Reasons

	Reasons For Watching			
	Wanted To See	Usually Watch Then	Set Was On	Family Watching
Attentiveness				
To Comedy	.22***	-.11*	.05	.13*
To Crime	.11*	.09	-.03	-.12*
Overall	.23***	.01	.04	-.03
Channel Switching	.06	-.06	.02	.20**
Thinking While Viewing	.13**	.14**	.14**	.04

* p<.10
** p<.05
*** p<.01

All are partial correlations controlling for total television viewing